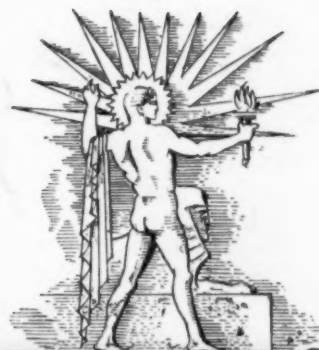


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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



April 4, 1942

From Northern Mountains

See Page 216

A SCIENCE SERVICE PUBLICATION

Do You Know?

The *Pekinese* was the royal dog of the Chinese emperors and mandarins.

Fourteen to thirty elements are needed for the optimum growth of *plants*.

Correct wheel balance and alignment will enable *tires* to wear 50% to 100% longer.

Seals take short "naps" by sinking to the bottom in shallow water and resting motionless.

Sperm oil, invaluable as a "breaking-in" oil for airplane motors, was formerly used to tan leathers.

One front wheel out of line only one-half inch will drag the *tires* sidewise 87 feet out of every mile.

A motorized division of ground forces alone will use as much as 75,000 gallons of *gasoline* in 24 hours.

Edison was the first person to say "Hello" on the *telephone*—before that, people used to say "Are you ready to talk?"

There are 700,000 named species of *insects*, and between 2,500,000 and 100,000,000 species altogether, according to estimates.

Instruction of New York's air raid wardens by *television*—something entirely new in education—is so successful it is to be continued indefinitely.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article

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RADIO

How can the best wavelength for short-wave radio be predicted? p. 216.

ZOOLOGY

What sea creature is named for President Roosevelt? p. 216.

Woodpeckers seldom injure trees, but destroy injurious tree insects.

Tanks can be fought with smoke, the Army Chemical Warfare Service has reported.

A motor fuel called *Jeanite* has been produced from blackstrap molasses by Dr. J. W. Jean of Louisiana State University.

Annual *steel-producing* capacity of the United States was increased 4,418,000 net tons last year, bringing the record total of 88,570,000 tons.

The *night-hawk* is often called the bull-bat; it is neither a hawk nor a bat.

Using *wooden front tires*, a New Jersey inventor attained a speed of 75 miles per hour on a concrete highway.

A 12-place troop-carrying *glider* will be built by a Baltimore aviation firm on an experimental basis for the U. S. Army.

Trailer-mounted *shower bath* units, which pump and heat water for eight shower-bath heads, have been developed for the Army.

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BIOLOGY

Synthetic Pain-Killing Drug May Be Morphine Substitute

Although Demerol Is Habit-Forming, It Does Not Cause Physical Craving for the Drug as Does Morphine

DEMEROL, new synthetic pain-killing drug that comes closest of any so far developed to being the long-sought safe substitute for the poppy's morphine, was introduced to American scientists at the meeting of the Federation of American Societies for Experimental Biology in Boston.

Favorable results from its first U. S. trials on nearly 1,000 patients and laboratory animals were reported by Dr. David R. Climenko, of the Research Laboratory of the Winthrop Chemical Co., Dr. Robert C. Batterman, New York University College of Medicine, and Dr. H. L. Andrews and Dr. C. K. Himmelsbach, of the U. S. Public Health Service's hospital for narcotic drug addicts at Lexington, Ky.

Summing up the observations of these men, it appears that relief of pain requires larger doses of Demerol than of morphine. Making up for this is the greater safety of Demerol which allows physicians to give much larger doses of it than of morphine.

The pain-relieving effect starts within 15 or 20 minutes and lasts for as long as six hours. It is most dramatic in patients suffering from the excruciating pain caused by kidney stones and gallstones.

Demerol, like morphine, is habit-forming, but unlike morphine, it has almost no addiction property, that is, it does not cause physical craving for the drug to the extent that morphine does. Laboratory animals could not be addicted to Demerol. Humans who had been morphine addicts became addicted to Demerol but only when given daily doses 35 times the size used to relieve pain in sickness or after surgical operations.

Demerol was first developed in Germany but is now being made in the United States. It is not yet available except to research institutions, pending approval by the U. S. Food and Drug Administration of an application for its more general release. Even if it becomes available commercially, it will probably

not be sold without a physician's prescription. This is because it is a habit-forming drug and one which makes a person feel so good right after taking it that it would be unsafe to allow it to be sold without restrictions.

Science News Letter, April 4, 1942

May Not Need Extra B₁

HEAVY drinkers of whisky and other alcoholic beverages probably do not require extra amounts of vitamin B₁ to protect their nerves and keep them healthy.

Experiments casting "considerable doubt" on the current theory that alcohol increases the body's need for this

vitamin were reported by Dr. J. V. Lowry, Dr. W. H. Sebrell, Dr. F. S. Daft and Dr. L. L. Asburn, of the U. S. National Institute of Health.

In these experiments rats kept on the water wagon without exception developed the severe nervous disorder believed due to B₁ deficiency in alcoholism before their litter mates that were getting alcohol or whisky. The nervous disorder could be prevented and cured by the vitamin, regardless of whether the rats drank alcohol, water or whisky.

These experiments give the first indication that alcohol does not require vitamin B₁ to help burn it in the body. They suggest that a person who sticks to a good diet could probably drink a quart of whisky daily without needing extra vitamin B₁ to burn the alcohol. If, however, he neglects his diet, as alcoholics probably do, and fails to eat enough foods containing vitamin B₁, he would develop the nervous disorder. The whisky or alcohol could be blamed for causing the change in diet but not for causing the sickness by depleting the body of the vitamin.

Science News Letter, April 4, 1942



RETREADING

Locomotive tires can be retreaded now even if automobile tires may not. Worn mine locomotive tires, once junked, are now being retreaded several times with each retread good for as much mileage as the original tire. The retread is steel.

Food Lack Causes Baldness

BALDNESS, cataracts of the eyes, poor teeth and inability to father offspring all may result from lack of one single food chemical in the diet, tryptophane.

This discovery was announced to the Federation of American Societies for Experimental Biology. The new studies that are expected to aid the vast job of post-war feeding of a starved world, were made by Dr. Wilhelm Buschke, Dr. Anthony A. Albanese and Dr. Richard H. Follis, Jr., of the Johns Hopkins University.

Tryptophane, the food chemical lack of which can bring on the four symptoms, is one of the 10 essential amino acids which are building blocks of proteins.

The proteins of cereals or grains in general contain considerably less tryptophane than proteins in animal foods such as meat, fish, poultry, eggs and milk. The discovery just reported indicates the danger of relying entirely on cereals as source of protein, as might be done in a post-war world faced with grave shortages of meat and other kinds of foods.

The danger of one-sided diets containing inadequate sources of amino acids has long been suspected. Studies by other scientists have shown that laboratory rats cannot manufacture the 10 essential amino acids in sufficient amounts in their bodies to supply their needs for normal growth. It was assumed that man also required these protein building blocks in his food.

The new discovery, however, shows for the first time the full extent of the damage resulting from lack of one of these acids, tryptophane, and gives also for the first time concrete evidence that humans as well as laboratory rats require this amino acid.

Human need for another amino acid, arginine, suspected of being a paternity chemical, has previously been reported by Dr. Albanese and associates. (See SNL, March 7)

The baldness, cataracts, malformation of tooth enamel and wasting of the male sex glands resulting from lack of tryptophane in the diet were demonstrated in paired feeding experiments with rats. But human volunteers who ate a diet lacking this chemical showed the effects of the deprivation through chemical tests. If they had continued as long on the

diet as the rats did, they would also have grown bald, the scientists believe.

The tooth defects and the cataracts occurred only in young, growing rats on the tryptophane-lacking diet. The baldness and sex gland destruction occurred in both young and old rats. The baldness and the cataracts could be cured

just by adding tryptophane to the diet.

Some of the changes resulting from lack of tryptophane also occur in vitamin A starvation. This may mean that without plenty of tryptophane, the body cannot use vitamin A even if it is present in the diet.

Science News Letter, April 4, 1942

ENTOMOLOGY

War Endangers Our Trees By Halting Fight on Pests

WAR-COMPELLED suspension of search in Japan for beneficial parasites of the Japanese beetle, and curtailment of domestic insect control plans, seriously jeopardize America's millions of shade trees and their protective camouflage value, warns Dr. E. Porter Felt, director of the Bartlett Tree Research Laboratories, Stamford, Conn.

"Although insect pests annually cause this country about one and one-half billion dollars loss each year, their adequate control is generally an overlooked phase of our war efforts," Dr. Felt stated. "The Japanese beetle, gypsy moth and elm leaf beetle all are more widely distributed today than 40 years ago. Thorough, timely and continuous spraying

is imperative lest their ravages cause widespread defoliation and serious injury to our trees—now more important than ever before because of their morale, health and protective camouflage value during the war emergency."

Limiting the amount of spraying in certain localities to conserve chemicals may be possible, Dr. Felt added, but complete suspension of control operations would be "most unwise." Entomologists and tree experts should be consulted whenever control curtailment is under consideration. Their advice may prevent serious disaster to one of the nation's most valuable physical and esthetic assets—its shade trees.

Science News Letter, April 4, 1942



PORKY UP A TREE

This bristly creature of northern forests posed on a limb for the portrait that appears on one of the new wildlife stamps. It is a characteristic place for Porky; despite his short legs and deceptive appearance of clumsiness, he's a good climber.



FISH FOR FUN AND FOOD

The eastern pickerel, one of the several fish pictured in the new series of wildlife stamps, needs no introduction to fishermen. There's plenty of fun in fighting him to the catch, plenty of good eating in him after he's landed. (See page 221.)

CHEMISTRY—BOTANY

Baby Gives His Pants For Country's War Effort

They Are Being Wrapped Around the Army's Telephone Lines; 100,000 Miles of the New Wire Already Ordered

SO YOU'D give your shirt to help the U. S. A. to win the war? Of course you would.

Well, Baby's beaten you to it. He's already given his pants. They're wrapped around the Army's telephone lines.

How rubber latex that used to be used in making necessary articles of infants' wear now goes into insulation for light-weight communication lines was related before the Eighth Annual Chemurgic Conference in Chicago by Dr. M. C. Teague, research chemist of the United States Rubber Company. Dr. Teague told his audience of the scientific juggling which he and his colleagues have been carrying on since the emergency began, to make the country's limited supply of rubber stretch farther.

The latex-insulated telephone wire, samples of which he showed, is produced

by a multiple dip process using a special latex compound. It weighs only 30 pounds per mile, as compared with 168 pounds per mile of the older-type wire. The government has already ordered more than 100,000 miles of the new wire, enough to go four times around the earth.

The list of latex articles used in war is a long one. It includes bullet-proof fuel tanks for airplanes, life rafts, pilot balloons, gas masks, aviators' helmets, blackout paint, sponge cushioning for use in tanks, submarines, gunsight eye-pieces, and a thousand other things.

All of this has meant, of course, that civilians have had to get along without some of the things that have meant much to the amenities of modern life, especially the two-way-stretch fabrics that have come to be standard parts of bathing-suits, foundation garments, shoe

tops, suspenders, and "elastic" generally.

Again the rubber industry has come to the rescue. Dr. Teague told about a new "synthetic" latex made from reclaimed rubber, and exhibited samples of articles made therefrom. Of particular interest, to both military men and civilians, were elastic straps for gas masks, in which neither latex nor raw rubber had any part.

Science News Letter, April 4, 1942

Milkweed for Kapok

KAPOK, tropical floss used in life-preservers, pillows and heat-insulating coverings, can have its war losses at least partly made good by the substitution of milkweed down, Dr. Boris Berkman of Chicago told the conference.

Kapok and milkweed floss are very closely similar, despite their diversity of origin, the speaker declared. Kapok is borne in seedpods of tropical trees, milkweed in similar pods on tall temperate-zone herbs. But to the naked eye, and even under the microscope, they are astonishingly alike. The fibers of each are of approximately the same size, and both are hollow, with great flotation power provided by the inner air space.

Science News Letter, April 4, 1942

Arsenals of Democracy

FOUR million-dollar laboratories of the U. S. Department of Agriculture, originally planned as means for increasing the peace-time prosperity of American farmers and industrial users of farm products, have under the stress of war become four great arsenals of democracy, Dr. Henry G. Knight, chief of the Bureau of Agricultural Chemistry and Engineering, declared.

When the first of the four laboratories of Peoria was being dedicated only two years ago, Vice President Henry A. Wallace, then Secretary of Agriculture, remarked, "It is a comforting thought to know that this great research laboratory, and the other three that are under construction, could be turned into research institutions for national defense should the occasion demand."

No one who heard that prophecy wanted it to be fulfilled, but, said Dr. Knight, "We didn't get our wish . . . Instead of being on a peaceful footing we are now fighting for what may be our very existence . . . I'm glad to be able to say to you on this occasion that these laboratories are living up to Vice

President Wallace's prediction. They, along with other research organizations and institutions, are contributing their bit to the defense of the country."

Science News Letter, April 4, 1942

Soybean Crops Needed

CHINA'S great contribution to America's victory farming, the soybean, will receive greater attention than ever during the coming crop season, G. G. McIlroy, director of the American Soybean Association, announced.

Nine million acres, 54% more than last year, are expected to be planted to this versatile crop, which can contribute feed for the production of meat and milk, oil for explosives, paint, soap and human food, or can be plowed under to give the soil the nitrogen which diversion of nitrates into munitions is taking out of commercial fertilizers.

Science News Letter, April 4, 1942

Insecticide Shortage

MUNITIONS for man's ceaseless defensive warfare against insects and plant diseases have been forced onto a scarcity basis because of the war, James R. Hile of the Acme White Lead and Color Works, Detroit, revealed. Part of the shortage is due to the more imperative demands of war industries for materials used in the making of fungicides and insecticides, part to the cutting off of overseas sources by Axis conquests.

Arsenic, classic standby of insect fighters, is hit both ways, Mr. Hile explained. About half of the arsenic used in this country comes in normal times from abroad, mainly from Sweden, Belgium and Japan. These sources are lost for the present. At the same time, other industries are demanding larger shares of the arsenic still available. Great quantities are needed in the manufacture of khaki cloth, blankets, etc. Arsenic is demanded in increased quantities for glass-making. It is also needed for the production of chemical weed killers, to replace chlorates now absorbed by the powder-mills.

Rotenone, one of the most important of the organic insecticides, used to come largely from the East Indies, which are now out of the market. South American rotenone, which used to supply about 40% of the nation's normal requirements, can be stepped up to perhaps 60%, but not more. This leaves a bad lack, with no replacements in sight.

A similar situation holds with respect

to the other great plant source of insecticide, pyrethrum. The principal source of this used to be Japan, but the British African colony of Kenya has almost entirely displaced our present Axis enemy so far as pyrethrum is concerned. The entire requirement for 1942 can be supplied from Kenya, if enough shipping space can be made available.

So far as arsenic and rotenone are

concerned, the situation is being saved largely through careful distribution of available supplies. Non-essentials, like grub-proofing of lawns and golf greens and protection of ornamentals, are being put on short rations, and the supplies on hand are being directed to the combating of pests and diseases attacking principal food and fiber crops.

Science News Letter, April 4, 1942

GENERAL SCIENCE

Unified Science Must Serve Unified World After War

Annual Report of Rockefeller Foundation Points Out Nationalistic Partitions in Science Must Disappear

NATIONALISTIC partitions within the world of science must disappear in the world which scientists are to aid in reconstructing after the war, declares President Raymond B. Fosdick of the Rockefeller Foundation, in his annual report.

This is, of course, not a brand-new idea, Dr. Fosdick points out. Scientists have been feeling their way in that direction for at least 300 years—ever since physical science has been recognizable as a distinct field of human thought. But the post-war years must see an acceleration of the process.

"In brief, the age of distinct human societies, indifferent to the fate of one another, has passed forever; and the great task that will confront us after the war is to develop for the community of nations new areas and techniques of cooperative action which will fit the facts of our twentieth century interdependence. We need rallying points of unity, centers around which men of differing cultures and faiths can combine, defined fields of need or goals of effort in which by pooling its brains and resources the human race can add to its own well-being. Only as we begin to build, brick by brick, in these areas of common interest where cooperation is possible and the results are of benefit to all, can we erect the ultimate structure of a united society."

In the meantime, the Foundation faces the problems and perils of the immediate present. Outstanding in its contributions to the nation's total war effort are the measures taken for the protection of American and Allied troops

against tropical diseases, especially the yellow fever that still lurks in Africa and the malarias that beset the defenders of civilization all the way from Trinidad to the Burma road.

Another activity of the Foundation has been the recording on microfilm of vast quantities of scientific data and historic records in bombarded Britain. These compact duplicates of civilization's basic documents can be easily transported out of harm's reach, or buried deep beyond any bomb's penetration. If the bulky originals are destroyed, the microfilm records will still enable scholars of the future to build again on the foundations of today and all past ages.

Science News Letter, April 4, 1942

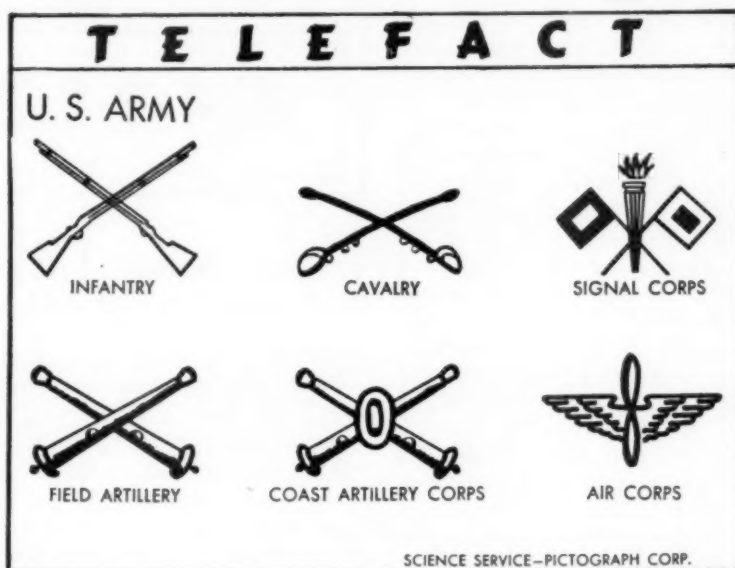
ASTRONOMY

Swift Stellar Object Still Unsolved Mystery

By CHARLES A. FEDERER, JR.
Harvard College Observatory

THE fast-moving object in the constellation of Leo, the lion, discovered by Dr. Y. Vaisaeae of Turku, Finland, on March 12, has been confirmed and photographed by astronomers at the Lowell Observatory at Flagstaff, Arizona. However, it is not yet known whether the new object is a comet or an asteroid (*See SNL*, March 28).

A week after its discovery, the Lowell observations, made by H. L. Giclas, show that the object is moving about one minute of arc every 15 minutes, which is rather fast for an asteroid, especially since its apparent path is at



right angles to the ecliptic and directly across the sky from the sun. If it is a comet it may have already come nearest the earth, for its motion is slowing down, which may indicate the object is going away.

On the other hand, an asteroid might appear to move this way, if it had an orbit of high inclination to the earth's orbit.

In a letter to Harvard Observatory, clearing-house for astronomical news in the western hemisphere, Dr. V. M. Slipher, director of Lowell Observatory, writes:

"Herewith are two positions of the fast moving object, obtained by H. L. Giclas, of our staff. He photographed it both with the 13-inch search telescope and with our 9-inch Schmidt of 22-inch

focus. On both negatives the images are not stellar but are somewhat diffused and have the appearance of comet trails."

The positions are: March 18 at 1:27 a.m. EWT, 11 hours 12 minutes 45 seconds; plus 11 degrees 41 minutes; March 19 at 2:08 a.m. EWT, 11 hours 15 minutes 3 seconds; plus 13 degrees 24.5 minutes.

This indicates that in the week after its discovery, the object had moved 15 degrees or one twenty-fourth of the way around the sky. Its motion is just west of north, and on the evening of March 24-25, it passed about six degrees west of and slightly north of the star Delta Leonis. However, only large telescopes can see it, as it is of the thirteenth magnitude.

Science News Letter, April 4, 1942

ENGINEERING

Army Backs Total Blackouts Doubts Value of Dim-Outs

Air Is Clear Over America and Faint Lights or Puzzling Patterns Would Not Deceive, Is Belief

TOTAL blackouts of all illumination visible from the air, not pattern blackouts nor dim-outs, will continue to be the favored method of anti-air raid precautions, high officials of the Army Engineer Corps told Science Service.

These officials said demands for pattern blackouts by commercial electrical engineers have been thoroughly studied

by Army engineers and found unsuited to this country. They added that the clamor for pattern blackouts has served only to confuse civilians.

"In Great Britain," they explained, "the enemy is presented with a concentrated target more easily defended by anti-aircraft fire, barrage balloons and interceptor planes. Enemy planes must

fly at a high altitude and hence ground lights are less easily seen. Further, atmospheric conditions are usually poor.

"The United States is exactly opposite. Its vast coastlines make concentrated defense virtually impossible. The air is more clear than over England. Enemy planes, therefore, can come in at comparatively low altitudes and any pattern of ground lights can be picked up by the pilot and may be helpful as a reference point. A total blackout, on the other hand, is quite effective."

Army engineers doubt that pattern or camouflage lighting which seeks to mix up normal street lighting patterns would confuse an expert navigator. In the first place, they say, the navigator can reach a city by instruments, and need not rely on ground lights. Once over a city at comparatively low altitude he can pick up features of the terrain, rivers, hills, etc., to guide him to the target carefully located on his map.

"Suppose," they continued, "an enemy pilot is confronted by pattern lighting on the ground. He does not attempt to find his exact target by these lights, but discovers it by features of the terrain shown on his map or by flares. Once he spots his target he then uses the lights he sees as reference points to guide him while he circles or otherwise maneuvers to get over the target. Thus the lights which are supposed to confuse him actually aid him. Any fixed light can serve as a useful reference point to the target, hence the dim-out too is ineffective. Further it does little to eliminate dangerous traffic conditions.

"On the other hand," the Army engineers explained, "a total blackout, if really complete, greatly adds to a pilot's troubles.

"While he may find his target by noting the terrain carefully, the instant he begins to circle or maneuver in any way, he loses it again, if there are no lights to serve as reference points.

"Meanwhile the anti-aircraft and interceptor planes are given valuable time to get in their licks."

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The modern *circus* may have been invented by an eighteenth century British cavalryman named Philip Astley, who taught his mount tricks, later gave exhibitions which included performing humans.

Peru has the highest standard-gauge railroad in the world—at one point it reaches a height of 15,665 feet.

ZOOLOGY

New Tiny Sea Creature Described by Smithsonian

ATINY sea creature, new to science and named in honor of President Roosevelt, has just been described in a new Smithsonian Institution publication by Clarence R. Shoemaker of the U. S. National Museum scientific staff. It recalls the President's carefree fishing trip in what turned out to be the last peacetime year, on the cruiser Houston, lately lost in action against the Japanese off the coast of Java.

The little animal has been given a name out of all proportion to its quarter-inch size: *Neomeganphopus roosevelti*. It belongs to the zoological group known as the amphipod crustaceans, which are relatives of shrimp, and more distant kin of lobsters and crabs. Although it is of insignificant size individually, it swarms in such uncountable billions that it is an important item in the diet of fish in Magdalena bay on the coast of Lower California, and thus plays its part as an important economic species, since the fisheries of Magdalena bay are rated among the best on the Pacific coast, for both food and sport.

The new species was collected on the 1938 Presidential cruise, by Dr. Waldo L. Schmitt of the Smithsonian staff, who was with the expedition as naturalist.

Science News Letter, April 4, 1942

ZOOLOGY

Ten New Mammal Groups in Natural History Museum

See Front Cover

TEN LIFE-LIKE groups of North America's rarest big game animals have just been completed for a new exhibit hall in the American Museum of Natural History and will be given their final inspection by officials of New York City and trustees of the Museum on Wednesday, April 8. Subsequently they will be thrown open to the public.

The new Hall of North American Mammals has been under construction for six years, while taxidermists have prepared the mounts of the great animals by modern, sculpture-like techniques. In the meantime artists visited the actual spots where the animals had been collected, to make sketches for the preparation of the realistic backgrounds against which the groups are displayed.

Some of the animals were obtained through the cooperation of the Cana-

dian government and the U. S. National Park Service, which permitted the collection of specimens in areas where ordinary hunting is rigidly prohibited. In some instances the animals could have been found nowhere in unprotected areas.

One of the rarest of the animals shown, a species which most people never do see at all, is the white mountain sheep, a snowy-fleeced relative of the bighorn sheep. It lives on high mountains in Alaska; the Museum's new group is shown against background representing the upper slopes of Mt. McKinley.

The ten groups in the new hall comprise Alaska brown bear, grizzly bear, bighorn sheep, white mountain sheep, Grant caribou, Osborn caribou, muskox, mountain goat, bison, Alaska moose.

Science News Letter, April 4, 1942

RADIO

Best Wavelength Predicted For Short-Wave Radio

AUTOMATIC recordings of electrical conditions in the upper atmosphere have made it possible to predict with accuracy the best frequency (or wavelength) to use in short-wave radio communication between given points, for a given season of the year and a given time of day. This announcement was made at a meeting of the Washington Academy of Sciences by Dr. T. R. Gilliland, of the National Bureau of Standards.

The automatic multi-frequency recorder is a development of the technique used by Dr. Gregory Breit and Dr. M. A. Tuve in the United States and Prof. E. V. Appleton in England about 16 years ago to investigate the ionosphere or electrically conducting layers of the upper atmosphere. Their method was to send up short pulses of high-frequency waves of different wavelengths and measure the echo time or time for the waves to go up and back.

These layers change greatly from day to night and from summer to winter and according to the number of sunspots on the sun, and greatly affect short-wave communication.

Automatic recordings have now been made in several parts of the world for almost one complete sunspot cycle of 11 years. It is this accumulation of records that now makes it possible to specify the best wavelength to use under any particular circumstances.

Science News Letter, April 4, 1942

IN SCIENCE

CHEMISTRY

Bridal Clothes of Bread And Milk Are Foreseen

BRIDES of tomorrow may adorn themselves in going-away suits of bread and milk, if research under way at the Department of Agriculture proves successful.

Synthetic wool fibers have already been made from milk casein, and now it appears that wheat gluten is another protein ideally suitable for production of synthetic fibers.

Chemists at the Department's western regional laboratory have already produced good fibers from the wheat gluten, and if a new use for the resulting wheat starch can be found, the process will be practical.

Science News Letter, April 4, 1942

MEDICINE

Ready-Made Spare Parts For Skull Now Available

READY-MADE spare parts for repairing defects in human skulls are now available, Dr. Claude S. Beck, of Western Reserve University School of Medicine, reports (*Journal, American Medical Association*, March 7).

They are metal plates made of the alloy, vitallium, which doctors have found most satisfactory for repair of skull and other bone defects. Heretofore plates used to repair skull defects, for example to replace a piece of skull removed in case of tumor, have been specially cast from a pattern of the skull defect. Dr. Beck had "the idea of using plates made up in various sizes and kept in stock so that the surgeon could use them when needed."

The plates might be useful in the care of war wounds, he points out. If the wound is not infected, the plates might be put in at the first operation.

"Almost any defect can be repaired by plates whose measurements are 6, 10, and 14 centimeters in length and 2 or 3 centimeters in width," Dr. Beck states.

The plates have a gentle curvature which may be altered by means of pliers. They are attached by vitallium screws.

Science News Letter, April 4, 1942

THE FIELDS

NUTRITION

Army Using Dried Foods By Millions of Pounds

DEHYDRATED vegetables by millions of pounds will constitute part of the Army's vast shipments of supplies to our troops in Australia and elsewhere overseas. Quartermaster purchases of 18 million pounds of seven "bulk" vegetables have been announced, with more to follow.

The vegetables to be handled in dehydrated form all contain large percentages of water when fresh; they are potatoes, sweet potatoes, onions, carrots, cabbages, beets and rutabagas. Elimination of excess water from potatoes alone will, it is estimated, save the army shipping space equivalent to two whole freighters.

Dehydrated vegetables were tried out by the first A.E.F. in 1917-18, but the dehydration industry was still in its infancy then and results were not satisfactory. Great improvements in technique during the past couple of decades are expected to insure success this time.

Science News Letter, April 4, 1942

CONSERVATION

Save Water as Well as Tin For War, America Is Urged

AMERICA, gravely concerned with saving rubber, tin, aluminum, oil and other military necessities, must be no less earnest in saving its great resource of pure water, Rep. Karl E. Mundt of South Dakota urged before the Izaak Walton League of America meeting in Chicago.

Water, the Congressman reminded his hearers, has been a matter of military importance since the earliest recorded wars. Walled cities of antiquity, defying assaults of their enemies, could be brought to sue for peace by cutting off their aqueducts. And only the other day Hong Kong and Singapore were brought to the same humiliating fate by the same means.

By wasting water supplies needed for human consumption or industry, worse

still by polluting their sources, Americans become their own enemies, Mr. Mundt warned. He continued:

"While engaged in this nation-wide conservation effort of the things immediately useful in our drive for victory, America should also give serious thought to the less obvious values accruing from the even more far-reaching effects of wise conservation of all the natural resources of this country. It is from the woods, waters, and wildlife of America, combined with our natural metallurgical resources, that America must get the raw materials from which to make the fighting tools of modern war. The waste or abuse of our natural resources should today be equally condemned whether it be the products of the oil well and the copper mine or the products of timber, the virtues of pure water, the sanctity of bird refuges, or some other aspect of the League's comprehensive program to take less of today in order to save more for tomorrow."

Science News Letter, April 4, 1942

GEOLOGY

100% Pure Nitrogen Gas Flows In Eastern Wyoming

PURE NITROGEN gas flows from a recently drilled well in an eastern Wyoming ranch, Harold Cook, consulting geologist of Agate, Nebr., reports (*Science*, Feb. 27). This is believed to be the first nitrogen gas well ever struck.

The well was being drilled for water, Mr. Cook reports, when it began to yield gas at a considerable pressure at a depth of only 156 feet. A sample was taken and sent to the laboratory of the U. S. Geological Survey at Casper, Wyo., for analysis. J. G. Crawford, chemist of the laboratory, found it to be 100% nitrogen.

Nitrogen, which is mixed with oxygen in ordinary air, has no fuel value. However, because it is inert, combining with other elements only under special conditions, it is used in making artificial atmospheres where it is desirable to exclude oxygen, and thus has considerable value in many industrial operations, such as rubber storage. At present, nitrogen is obtained by extracting it from the air, usually as a byproduct in liquid air manufacture.

Since an apparently large supply of pure nitrogen, all ready to use, may have value in the present war emergency, the new-found well has been shut down and closed, to conserve the gas until possible uses are developed.

Science News Letter, April 4, 1942

FORESTRY—RESOURCES

U. S. Cork-Producing Possibilities Studied

EXPERIMENTS in planting cork oak, from which cork is stripped, are planned by the Department of Agriculture, if the Forest Service can get acorns from the Mediterranean region (*Journal of Forestry*, March).

Normally this country imports about \$10,000,000 worth of cork every year from Spain, Portugal and North Africa. Parts of the Southwest—southern California, Arizona, New Mexico and Texas—have a similar climate, and the Department believes cork should do well here.

From a few cork oaks planted in California more than 70 years ago, good first-yield cork has been gathered under supervision of the Agricultural Extension Service of the University of California.

Several native trees already produce a kind of cork suitable for several types of products, such as heat insulation and packing material. These include Southwestern fir, which produces a soft pure cork, and the more common Douglas fir, with its corky outer bark. White fir also offers some possibilities.

Science News Letter, April 4, 1942

DENTISTRY

Boxing Gloves, Golf Balls Newest Thing for Teeth

BOXING gloves, celluloid mouth bits, even golf balls, may be useful in preventing the common dental condition in children known as malocclusion, or faulty meeting of the upper and lower teeth, according to Dr. Leland R. Johnson, Chicago dentist. Dr. Johnson addressed the 78th annual midwinter meeting of the Chicago Dental Society.

Boxing gloves may be tied on a youngster's hands at night to prevent thumb-sucking, a frequent cause of malocclusion, according to Dr. Johnson, while to prevent "mouth breathing," another cause, a small celluloid mouthpiece can be held between the lips while the child is reading or studying.

The habit of many children of sleeping with their faces on their hands or fists may cause malformed jaws. It can be prevented, Dr. Johnson said, by preventing children from sleeping on their stomachs. The cure consists of sewing a row of golf balls in the front of the child's pajamas, thus keeping the child sleeping on his back to avoid discomfort.

Science News Letter, April 4, 1942

GEOPHYSICS

Geophysics Goes To War

Physical Forces Become Scientific Sleuths, Burrow Into the Ground, Plumb the Sea and Explore the Air

By DR. MORTON MOTT-SMITH

UNSEEN scientific fingers—waves of earth, air and radio—are prying into the secrets of our enemies and bringing back information that often means the difference between disastrous surprise and militant alertness.

A sneaking airplane miles out at sea is spotted by a radio locator. A dangerous mine buried deep in the earth is located by magnetic effect. A submarine is found lurking in the ocean depths.

To the purposes of war there are adapted the clever means that physicists have been using to locate the rich pools of petroleum in the layers of the earth, to find the hidden deposits of coal and needed ore; to locate earthquake faults, to test the solidity of the ground on which dams, bridges, fortifications and other heavy structures are to be erected, or for the purely scientific purpose of determining the geological structure of the earth below ground.

Buried munitions dumps, mines, bombs and shells, underground waters, pipes and even mere cavities, can be located by the same methods that have been used to locate oil, coal and mineral deposits buried deep in the earth.

Artificial earthquakes produced by dynamite explosions, electricity, magnetism, radioactivity and the force of gravity, are some of the agents employed. These scientific sleuths can burrow as much as three or four miles into the earth and give information as to what is down there. From the purely scientific point of view, they are of enormous value in determining the geological structure of the earth below the ground.

Listening devices determine the approach of submarines or airplanes. Sound-ranging helps to locate the position of enemy guns or to determine the range of our own guns.

Echo depth sounding, which located so dramatically the wreck of the *Lusitania* and has been of inestimable service in the more exact delineation of the sea bottom, makes use of supersonic waves; sound waves whose pitch is too high to be heard by human ears. The method will doubtless find extensive

use in the present war and afterwards in locating ships that have been sent to the bottom, lost equipment, sunken mines, harbor obstructions, etc. By means of echo sounding, a ship may safely navigate in a fog by keeping in constant touch, so to speak, with the bottom.

Communication between surface vessels and between surface vessels and submarines is often accomplished by sonic or supersonic means.

Land and sea mines can be controlled by radio or acoustic impulses.

Applied to airplanes, echo sounding makes use of high-frequency radio waves, sent down by the plane and reflected back to it from the surface of the earth. The pilot can read at every moment his height above the ground on an instrument dial.

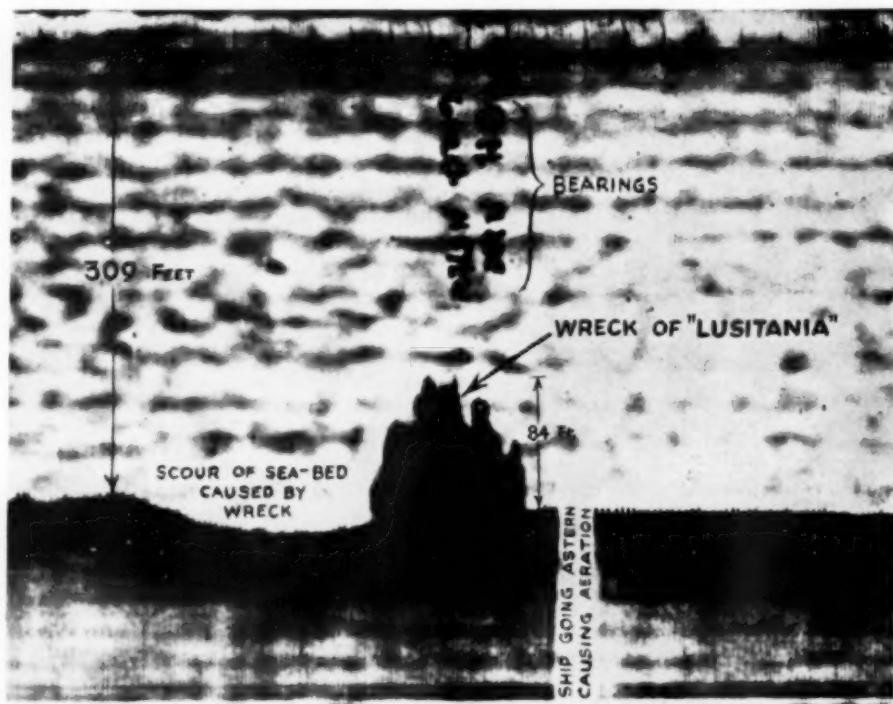
Finally there is the airplane radio locator, brought strongly to the public attention by England's call for operators,

which likewise makes use of reflected radio waves to locate the enemy's airplanes.

All these methods belong to the general subject of geophysics or physics of the earth. Although some of them are applied to the sea or the air, they are the same in principle as those used in delving into the earth, and all have the same purpose—that of detecting and locating objects or dangers beyond the reach of human eyes or ears. In any case, the oceans and atmosphere are parts of the earth.

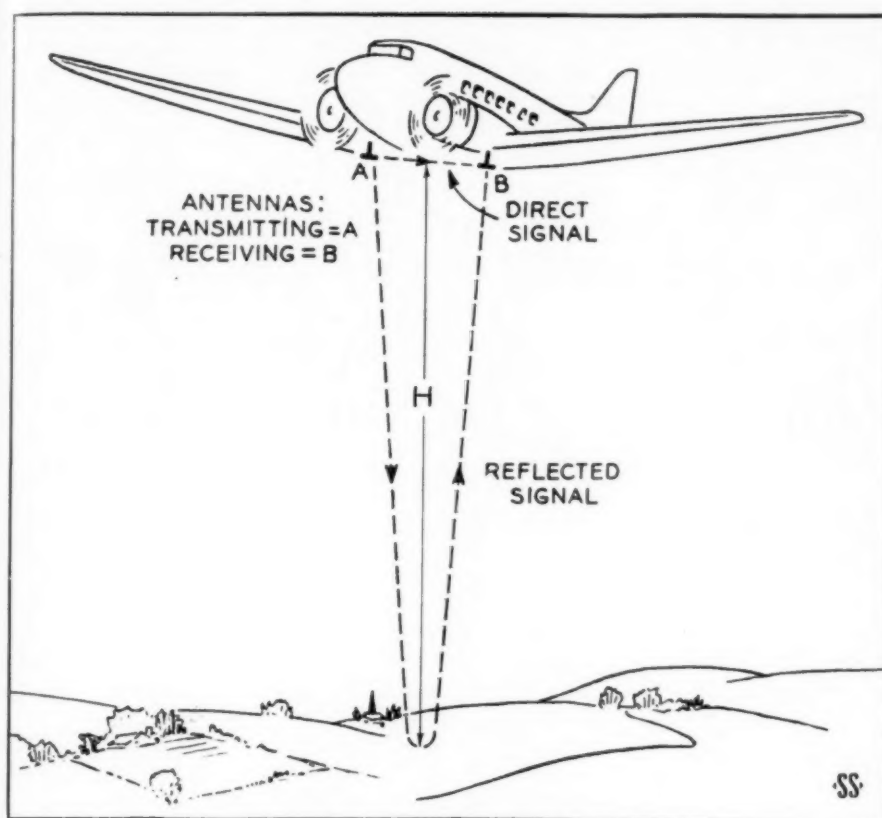
Doubtless many advances over what is now generally known of geophysical methods have been made by the great army of government scientists who are employing all their time and talents to get there first with the most and best inventions. What advances they have made or will make, what new instruments and methods they may devise, will be known after the war. Nothing can or will be told here that would be of value to our enemies.

It may be worth while, however, to tell something of the ingenious methods



SEARCHING SEA BOTTOM

How sound waves reveal vessels on the ocean floor is shown by this actual record of the finding of the *Lusitania*. Photo from "Precision Echo Sounding and Surveying" by Lieut. Comdr. D. H. Macmillan, R.N.R.



INDICATING HEIGHT ABOVE GROUND

This diagram is from the Colorado School of Mines Quarterly.

and devices that are now used in exploring the earth, sea and air.

One of the most used in prying up underground secrets is the method of the artificial earthquake—called seismic exploration. The "earthquake" is produced by exploding a charge of dynamite in a hole five or six inches in diameter and 20 feet or more in depth. The seismic wave spreads out in all directions. Some of it travels directly along the ground; a part of it bends around again by refraction, similar to a mirage, and returns to the ground; the rest penetrates deeply and is reflected back wherever layers of sufficiently differing densities exist.

Some distance from the shot hole, a number of receptors or pick-ups are strung along the ground. These are nothing other than miniature portable seismographs, similar to the large instruments that pick up real earthquakes. The agitations of these receptors are transported electrically to an instrument truck where they are recorded as wavy lines on a moving strip of photographic paper, one line to each receptor.

An accurate tuning fork makes time marks on the paper from which the

time of arrival of each impulse can be read to a thousandth of a second. From such a record, the depths and inclinations of the reflecting beds can be calculated.

This method is particularly useful in determining underground geological structure. It does not directly detect oil or other desired minerals. But geologists know that these various minerals are associated with particular geological structures, so that when the latter are found, the former are likely to be present also.

Other methods of exploring the depths of the earth consist in measuring the variations from place to place in the force of gravity or of the earth's magnetic field, or of shooting electric currents into the earth and exploring the resulting electric fields. The electrical methods are many because continuous or alternating currents may be employed. In the latter case there is a wide range of frequencies to choose from. Or sudden transient impulses may be employed.

A variety of electrical properties are thus determined. By exploring the whole field produced at each set-up, even the depths at which the materials lie can

be ascertained. Where the lines of electric or magnetic force come up, indicates the depth of the materials they passed through in somewhat the same way that the refracted or mirage seismic ray does.

All of these methods are indirect in that the geologist has to identify the materials by correlating their properties as found in the field with those determined in the laboratory.

The only direct geophysical methods are the finding of magnetic ores by means of the magnetic needle or magnetometer, and the finding of oil by scientifically smelling out the gases given off by it.

Geophysical prospecting has achieved its greatest successes in discovering petroleum. Applied to other materials, its methods are not so definite or certain, perhaps because there has been no such tremendous demand for geophysical work in these fields as there has been in the petroleum field.

But a government-sponsored program is under way to improve and apply geophysical methods to the search for vitally needed new sources of our scarce war metals—aluminum, chromium, manganese, mercury, nickel, tin, tungsten and others. Any and all of the various geophysical methods are applied according to circumstances, and all are indirect. These and other war uses of geophysics have been described by Dr. C. A. Heiland and published in the Colorado School of Mines quarterly.

Thus bauxite, the ore of aluminum, cannot be directly detected. But it occurs in connection with intrusive igneous rocks which have magnetic properties that can be detected by the magnetometer. The seismograph determines the depths at which these rocks lie and their contour.

Chromite is associated with heavy ultra-basic rocks and both gravity and magnetic methods help to locate the host rock.

Manganese is traced by magnetic and electrical methods through its association with igneous and metamorphic rocks.

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The method has been used in Russia, Cuba, and Virginia.

The ore of mercury is cinnabar, very heavy and practically a non-conductor of electricity. But the deposits are too small to affect sufficiently the overall density or conductivity of the host rock. However, it occurs in conjunction with dikes and faults which can be found by electrical and magnetic methods.

Most of our nickel comes from Canada. It occurs in connection with pyrrhotite, a very heavy rock easily magnetized and a good conductor of electricity. This one is easy.

Tin, our chief headache, occurs largely in placer deposits like gold. It is frequently associated with magnetite which can be traced by its magnetic properties. Tin is heavy and usually sinks through the gravel beds to the bed rock. The contour and depth of the latter can be determined by seismic and electrical methods. These methods have been successful in locating placer gold deposits. But neither these nor other methods have disclosed any but the most meager and expensive sources of tin in this country.

The Foundations of Conservation Education

Edited by Henry B. Ward,
Emeritus Professor of Zoology,
University of Illinois.
Published by The National
Wildlife Federation

A symposium participated in by several of the most active researchers and thinkers in the field of conservation:

Conservation, Liberty and Economics by Wesley C. Mitchell; Conservation of Soil as a Natural Resource by W. C. Lowdermilk; ABC of Conservation by Paul B. Sears; Pitfalls of Conservation by Arthur N. Pack; Role of Applied Science in Conservation and Its Relation to Wildlife by W. W. Horner and Richard W. Horner; Biology As the Foundation of Conservation Education by Henry B. Ward.

Dr. Ward's section is of particular importance to teachers because it stresses certain weaknesses in the teaching of biology and proposes remedies that would strengthen the program of conservation education.

242 pages \$1.00 cloth, 60c paper

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Science News Letter, 1719 N Street, N. W.
Washington, D. C.

Tungsten occurs as wolframite, which is dense and moderately magnetic. But, like cinnabar, it occurs in quantities too small to sensibly affect the properties of the surrounding rocks. However, it has

one outstanding property, fluorescence. Unfortunately, this property is of no use until samples suspected of ore are found and tested.

Science News Letter, April 4, 1942

CHEMISTRY

Poison Gases May Be Used By Retreating Armies

Persistent Contaminants Such as Mustard Gas or Lewisite May Be Spread After Men Are Safely Away

POISON GAS, thus far unused in World War II, may presently appear in a new role. It may be added to fire and dynamite in "scorched earth" tactics, to render pursuit difficult and occupation of evacuated areas risky for the enemy, suggests Lieut. Col. Alden W. Waitt of the Chemical Warfare Service. (*Army Ordnance*, March-April).

Some of the so-called poison gases, like mustard gas, Lewisite and other vesicants or blister-raisers, are not really gases at all, but liquids which are distributed for tactical purposes in the form of fine sprays or mists. They settle on foliage, soil, anything else they touch and cling there persistently. Any person unlucky enough to make contact with such contaminated objects is certain to be more or less severely poisoned.

To be sure, such contaminated areas may be de-contaminated with suitable chemicals, but this process is both costly and slow, hampering swift pursuit of a retreating foe and forcing occupying troops to move about in a suspected area only with extreme caution.

As retreat-covering weapons, these persistent contaminants may be applied in any one of several ways. Artillery or mortar shell will probably not be used; those are weapons of attack on active enemy positions. But retiring troops can drop small cylinders or other containers that will give out their dangerous contents after the men have moved on to a safe distance. Planes can swoop back and forth, releasing the spray like a curtain.

Specially equipped trucks have been experimented with by some powers: "The principle of action is the same for portable and vehicle appliances and consists of spraying the agent from the container by compressed air or by

special pumps operated by hand or motor. The Italian regulations describe similar devices for what they term soil contamination. These seem rather complicated and dangerous. If mustard is to be sprayed, it is best to be a safe distance away. Certainly pumping mustard by hand from a portable sprayer would be anything but healthy."

What seems like an especially effective method of using chemical means for covering a retreat is the chemical mine. It is like the high-explosive land mine now familiar in anti-tank defense, but is loaded with mustard gas or the like, with only enough explosive to throw it out in a great cloud when the firing mechanism is tripped by an incautious enemy. This has a double effect: it looses a high concentration of the deadly mist so suddenly that the unwarned troops may not have time to get their masks on, and it creates a contaminated area which cannot be safely entered until the decontamination squad has completed the clean-up.

Science News Letter, April 4, 1942

● RADIO

Saturday, April 11, 1:30 p.m., EWT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

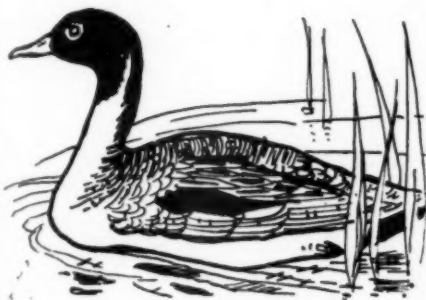
Dr. P. W. Bridgman, of Harvard University, will discuss the problems and techniques of high pressures.

Tuesday, April 7, 7:30 p.m., EWT

Science Clubs of America programs over WRUL, Boston, on 6.04, 9.70 and 11.73 megacycles.

T. Russell Mason, of the Massachusetts Audubon Society, will talk on "Are You Ready for the Birds?"

One in a series of regular periods over this short wave station to serve science clubs, particularly in the high schools, throughout the Americas. Have your science group listen in at this time.



A Week for Wildlife

EVEN the urgent needs of a nation at war must not be permitted to cause a letdown in efforts to conserve and restore America's resources in wildlife, in timber, in the basic wealths of uneroded soil and unpolluted water. These are too much needed, both for the immediate support of our fighters and productive population, and for their ultimate contribution to the tremendous postwar task of national and world reconstruction.

Realization of this lends new emphasis to the observance of National Wildlife Restoration Week, held this year April 12 to 18, under the auspices of the National Wildlife Federation. Throughout the land, in newspapers and over the radio, in schools, churches, clubs, scouting and other outdoor groups, the story of this nation's multiform campaign to keep all we can of the great continental heritage we received from the founders of America will be told, and new plans will be laid to restore so far as possible that which has been lost through over-optimistic exploitation in the past.

Signs of encouragement are to be found in recent official reports. There are now 178 refuges for migratory waterfowl and 25 refuges for upland birds and game. The duck and goose population as of January, 1941, was estimated at 70 million, an increase of five million over the preceding year, despite a considerable take by hunters during open seasons. The U. S. Fish and Wildlife Service states that the present commercial catch of 4.5 million pounds of fish can be stepped up to 6.2 millions to meet the war emergency, without seriously

impairing future supplies. So the picture is not as dark as it once was, though there is still great room for improvement.

A special feature of the week will be the launching of the annual sale of wildlife stamps by the National Wildlife Federation. The colored pictures of birds and mammals, fish and reptiles, trees and flowers offered this year are unusually well conceived and strikingly executed. Orders and inquiries should be sent, as in former years, to the Federation's office in Washington, D. C., in case they cannot be readily obtained locally.

Science News Letter, April 4, 1942



SCIENCE CLUBS OF AMERICA

Sponsored by Science Service

NEWS OF CLUBS

SYRACUSE, N. Y.—The Third Annual Science Congress for the Syracuse Science Center will be held on Saturday, April 25, at Syracuse University. Everyone is invited to participate in this Science Congress whether or not the individual belongs to an organized science club, just as long as some faculty member is willing to act as a sponsor. In both Junior and Senior Divisions, (the former taking in all ages up to fifteen years and the latter from fifteen to eighteen years) five Defense Bond or Stamp awards will be presented. The first award in each division is a \$25.00 Defense Bond; the second is \$8.00 in Defense Stamps; the sixth, seventh and eighth awards in each division are Honorable Mention ribbons. The event will feature lectures, demonstrations and exhibits. So whether you are an exhibitor or not, if you are in the vicinity of Syracuse be sure to attend this Science Congress. If you want further information or an entry blank, write to Dr. Richard R. Armacost, Director of Syracuse Science Center, Syracuse University, N. Y.

LOS ANGELES, Calif.—While up to the present America has not felt the pinch of a wartime economy it inevitably must come to pass. It is for this reason that a study of food requirements in war time and the presentation of special demonstrations of restricted diets and war economy in foods is being undertaken by the Bio Club of Chapman College. When other things besides sugar and rubber are rationed, members of this college group will be well prepared to furnish worthwhile suggestions. Members of the club also are working on present-day defense subjects and are typing blood of all students. At assembly and other programs the scientific hobbies of various members are exhibited. In many other ways the club shows a tendency to anticipate the needs of this country in the months or years to come. Dr. Florence Peebles, head of the Biology Department, is the sponsor.

LONGVIEW, Texas — What vocation should the student follow? That is a project being undertaken by members of the Lithium Chapter of the Texas Junior Academy at Longview Senior High School. But this club does not limit its activities to vocational guidance. A thorough study of the natural resources of the state is being made; a varied individualized experimental program is carried on; and an Open House exhibit is presented each spring. The club is sponsored by Adda Reid Templeton, chemistry and physics teacher.

MITCHELL, S. D.—The Science Club of the Senior High School has quite a problem on hand. It is not because of a lack of ideas but rather because there are too many problems which members would like to try to solve. One of the projects decided upon (and a very fine one indeed), is landscaping the high school campus. This is a long-range program of which the

members will be justly proud. Helen Field Watson, biology instructor, is the sponsor.

BRONX, N. Y.—How can we go about conserving rubber, paper, oil, sugar, etc.? What chemical or other substitutes can be found or developed for those articles now on the priorities list? What can be done by the citizen or school student during an air raid? How should First Aid be given in event of injury caused by bombs or explosives? And how can the morale of the school and home be kept on a high plane even in event of disaster? Those are only a few of the questions which members of the Science in Defense Club at Walton Junior High School, hope to be able to answer. It is obvious that the activity of this club is keyed to America's war effort. Katherine M. Byrnes, science teacher, is the sponsor.

Clubs are invited to become affiliated with SCA for a nominal \$2 for 20 members or less. You can become an associate of SCA for 25 cents. Address: Science Clubs of America, 1719 N St., N.W., Washington, D. C.

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PUBLIC HEALTH

Mass Immunization Urged Where Children Face Bombing

IMMUNIZATION of all school children, in areas most likely to be bombed, against smallpox, diphtheria, typhoid and paratyphoid A and B, scarlet fever and whooping cough, to prevent mass epidemics, was urged by Dr.

G. F. Amyot, Provincial Health Officer of British Columbia.

Speaking in Washington before the annual conference of State and Provincial Health Authorities of North America, Dr. Amyot also called for

evacuation of children from schools to their homes instead of attempts to shelter them in one spot. This plan, he explained, would prevent large numbers of children from being killed by a single bomb.

Dr. Amyot suggested that youngsters be divided into small groups of three or four to be led to their homes by an older child in case of an air raid.

In advising the mass immunizations, Dr. Amyot reminded his listeners that sanitary protection against the communicable diseases breaks down during bombing, and that immunization may become the only remaining protection against epidemics.

Organization of plasma supply systems for communities threatened by bombing was urged at the conference by a number of speakers. Dr. William McKay of Utah stressed the importance of plasma in treating shock, the primary condition which seriously burned or wounded patients present to the surgeon.

He described the Utah state program in which the state laboratories prepare the plasma from blood supplied by communities, then provide the community with plasma according to the amount of blood furnished. By testing and processing the blood in state laboratories, plasma banks can be maintained much more cheaply than if the plasma were bought from commercial concerns, Dr. McKay said.

Science News Letter, April 4, 1942

Man put the horse to work as long ago as 3,000 B.C.

Soap and water are the best antidote to contact of the skin with *lewisite* or mustard gas, according to Dr. Joel Hildebrand of the University of California.

Now Ready!

Ten New SCA Monographs

Science Clubs of America Monographs are well-written, carefully-edited pamphlets giving clear instructions and inspiring suggestions that will help any SCA group develop its own experiment or exhibit in the most effective and interesting way. Here are ten new monographs now ready for mailing at 10c each:

1. **How to Plan and Carry Out a Science Club Radio Broadcast**, by Harry A. Carpenter. With sample script by Paul E. Smith.
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5. **Making Herbarium Specimens**, by Minna S. Schaffer. Diagram of plant press.
6. **Home-made Photographic Equipment and Photo Hints**, by Jack Zimmer. Five diagrams.
7. **Maintaining a Tropical Fish Aquarium**, by Joseph H. Kraus. Diagram.
8. **Simple Breeding Experiments with Tropical Fish**, by Joseph H. Kraus.
9. **Gardening in a Wardian Case**, by William S. Thomas, M.D.
10. **Painting with Natural Flowers**, by Lionel Goodman.

Order SCA Monographs now! Use them as stepping stones to new and successful exhibitions and experiments.

SCIENCE CLUBS OF AMERICA

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SCIENCE NEWS LETTER

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New Machines And Gadgets

Novel Things for Better Living

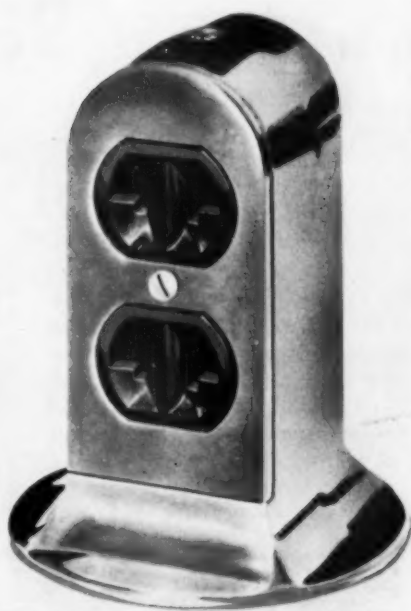
Two types of aluminum solder have been developed. One, to be used on sheet aluminum, melts at 750 degrees and has a tensile strength of 14,600 pounds per square inch. The other, intended for cast aluminum, melts at 900 degrees and the tensile strength tests 29,000 pounds per square inch. Neither type requires any flux.

Digging postholes will be made considerably easier by a newly invented augur that can be attached to the back of a tractor of standard construction and receives power from the tractor itself. Thus the tractor can move along the line of postholes and the digging is a matter of moving a few handles. The device can also be detached from the tractor when its use is not required. It is sufficiently powerful and rugged to operate a rock drill, so that holes may be bored through rock, coal or the like. If the tractor stands on sloping ground, adjustments can be made so that the holes will be vertical.

Scraping the insulation off a wire with a pocket knife is a difficult job for the amateur electrician and not good for the knife. A simple little invention recently patented makes the job easy and saves the knife. It is a flat piece of steel bent in the form of a Z. One end of the Z has a deep V notch cut into it. The sides of this V are beveled and sharpened. The other end of the Z serves as a handle. The wire is pressed into the bottom of the V and the instrument then pulled along the wire, thus scraping the insulation off.

Overheating of an electric iron when resting on its stand is prevented by a special kind of stand which cuts the current off when the iron is too hot. At the same time a lamp within the stand is lighted and its rays can be seen through holes in the stand, indicating that the current is off. The current is arranged to flow first through the stand and then through the iron, so that heat communicated by the iron to the stand operates a thermostat, contained in the latter, which breaks the circuit when the iron is too hot. This is an invention that has recently been patented.

The electric outlet, illustrated on this page, stands on the floor instead of being set into the wall. It is designed for factories, laboratories and other places where many outlets are required for machines, work tables or desks scattered all over the floor. These outlets are especially adapted to a cellular type of floor construction which provides channels for electrical wires, thus making practically the whole floor available for electrical services.



A tiny quartz balance sealed in a glass tube exhausted of air shows, while you wait, how a piece of steel half as big as a razor blade grows in weight as it rusts—a small amount of oxygen being admitted to the tube for this purpose. So sensitive is the balance, that a single layer of oxygen atoms 10 billionths of an inch thick and weighing 15 billionths of an ounce will tip the scales. The weight of the slightest bit of tarnish on a metal can be weighed to a 10-billionth of an ounce. The tests can be made at any temperature from 932 degrees down to -292 degrees Fahrenheit. Tests at different temperatures are important because, for example, stainless steel does not remain stainless above 1000 degrees Fahrenheit. The balance is made of quartz because this substance expands less than any other when heated.

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington, D. C., and ask for Gadget Bulletin 88. *Science News Letter, April 4, 1942*

ENGINEERING

New Blackout Bulb Developed by Army

A BLACKOUT bulb which eliminates need for special drapes and shades, gives ample light to avoid stumbling over furniture, yet cannot be seen from the air has been successfully developed and tested by Army engineers at Fort Belvoir, Va., and will probably soon be on the market.

The new bulb is heavily coated with black except for an orange button about the size of a nickel on the bottom. It burns on average house current and will

sell for about 25 cents. One bulb per room will provide enough light to permit occupants to see each other plainly, as well as furniture, doors and windows. Only the usual household curtains, drapes or shades are needed when this bulb is the sole source of light, engineers said.

Army pilots and engineers tested the bulb recently in a tiny town in New Jersey (only forty houses). Each home was equipped with the blackout bulbs and shades and curtains left up. When pilots flew over they were unable to see a single ray of light.

The bulbs were developed with the cooperation of the Nela Park Engineering Department of the General Electric Company at Cleveland, Ohio.

Army engineers explained that orange was selected as the color for the light-emitting button, since it is near the red end of the spectrum, yet unlike red is not confused with exit lights. Red has been found to be the light least visible from the air.

While the blackout bulb will not permit a person to read or play cards, it is safer and more convenient than no light at all. It can be used to light sections of the house where there are too many doors or windows for practical use of blackout drapes. One room of the house can be blacked out completely to permit reading with ordinary light while the rest of the house can be lighted with the special bulbs.

Science News Letter, April 4, 1942

More than 200,000 needed freight cars will be constructed this year, using lumber wherever possible to conserve steel.

The St. Bernard is one of the largest of dogs—he weighs as much as 200 pounds and measures more than five feet from nose-tip to root of tail.

★★★★★★★★★★★★

WYOMING

Fish in its mountain streams. Ride horse-back thru its hills and canyons. Find Indian relics and marine fossils in this region of great historical and geologic interest.

The Patons welcome a limited number of guests at their ranch home in the Big Horn country. Cabins are comfortable, food good and horses gentle.

Write for illustrated folder with map

Paton Ranch, Shell, Wyoming

•First Glances at New Books

AERONAUTICS

WHAT'S THAT PLANE? The Handbook for Practical Aircraft Identification — Walter B. Pitkin, Jr.—*Penguin*, 189 p., illus., 25c. The safety and even the lives of your neighbors may some day depend on your being able to tell by a look at an airplane in the air whether it is military plane or airliner, friend or foe. Meantime, airplane identification is fun, and can be mastered with the aid of the silhouettes, photographs and identifying data in this handy, pocket-size book published jointly by Penguin and The Infantry Journal. The planes included in this volume are those U. S., German, and Japanese aircraft most likely to be seen in large numbers over the United States, Canada, or Hawaii, or over shipping on the Atlantic.

Science News Letter, April 4, 1942

PHILOSOPHY

SCIENCE AND SANITY, An Introduction to Non-Aristotelian Systems and General Semantics (2d ed.)—Alfred Korzybski—*Science Press Printing Co.*, 798 p., \$6. Second edition of a book that created something of a sensation when it first appeared eight years ago, and which was largely instrumental in the development of Semantics as a university subject. Experiences in these courses are in turn reflected in this new book.

Science News Letter, April 4, 1942

HOME ECONOMICS

WOMEN'S MEASUREMENTS FOR GARMENT AND PATTERN CONSTRUCTION—Ruth O'Brien and William C. Shelton *Govt. Print. Off.*, 73 p., illus., 40c.

Science News Letter, April 4, 1942

MEDICINE

A PRIMER ON THE PREVENTION OF DEFORMITY IN CHILDHOOD—Richard Beverly Rancy and Alfred Rives Shands, Jr.—*National Society for Crippled Children*, 188 p., illus., \$1. Written for the family doctor, the public health nurse and welfare workers who, because they are likely to come in contact with the deformed or potentially deformed child before the orthopedist sees him, are in position to see that measures for prevention of deformity are started early.

Science News Letter, April 4, 1942

ZOOLOGY

COMPANION DOG TRAINING, A Practical Manual on Systematic Obedience; Dog Training in Word and Picture—Hans Tossutti—*Orange Judd*, 226 p.,

illus., \$2. The average dog owner, when he acquires a puppy, has visions of training him to be a watchdog, retriever, or what not — at least of inculcating proper dog manners. But after a few desultory and half-hearted attempts he is all too apt to give it up and let the pup "just grow". This is usually the result of not knowing enough about the dog. This book, written by a man who does know dogs and has trained many of them successfully, should enable the person of average intelligence to train a dog of average intelligence into an obedient, well-mannered companion.

Science News Letter, April 4, 1942

PHYSICS

EXPERIMENTAL PHYSICS — D. H. Bellamy—*Chemical Pub. Co.*, 255 p., \$3.75. English schools are now laying more emphasis on the practical side of physics than formerly. The 200 experiments described in this book are designed to meet that demand. They would serve well also for a practical laboratory course in American schools.

Science News Letter, April 4, 1942

CHEMISTRY AND PHYSICS

HANDBOOK OF CHEMISTRY AND PHYSICS (25th ed.)—Charles D. Hodgman and Harry N. Holmes, eds.—*Chemical Rubber Co.*, 2503 p., \$3.50. Included in the new edition are a table of natural secants and cosecants, the new standardized symbols used in mathematics and science, and additional material on amino acids, isotopes, vitamins and photographic plate and film speeds.

Science News Letter, April 4, 1942

ZOOLOGY

INTRODUCTION TO VERTEBRATE EMBRYOLOGY (4th ed.)—Waldo Shumway—*Wiley*, 372 p., illus., \$4. A new edition of one of the best-known textbooks in its field. The many new developments in embryology that have taken place since the appearance of the third edition, in 1935, have been duly taken into account in the revisions and additions made here.

Science News Letter, April 4, 1942

BIOLOGY

STUDIES AND ACTIVITIES IN BIOLOGY—Chapin W. Day and Margaret Ritchie; John W. Ritchie, ed.—*World Book Co.*, 218 p., 80c. A workbook for high school courses.

Science News Letter, April 4, 1942

ETHNOLOGY

THE STORY OF EVERYDAY THINGS — Arthur Train, Jr.—*Harper*, 428 p., illus., \$3.50. A well-known author, who has always been especially interested in the way people have lived on this continent, here presents a fascinating and comprehensive review of the material constituting the background of American history: Indian tipis, Spanish missions, French forts, Colonial mansions, pioneer cabins, modern houses—and hot-dog stands. The author turns them all inside out, showing the host of interesting objects they contain and explaining the human meanings of those objects.

Science News Letter, April 4, 1942

BOTANY

MOSS FLORA OF THE WILLAMETTE VALLEY, OREGON—Clara J. Chapman and Ethel I. Sanborn—*Oregon State College*, 72 p., illus., 50c.

Science News Letter, April 4, 1942

CHEMISTRY

SEMIMICRO EXPERIMENTS IN GENERAL CHEMISTRY — W. Bernard King — *Prentice-Hall*, 137 p., illus., \$2.50. This is a laboratory manual designed to wean the student away from wasteful habits acquired by the use of large-sized apparatus and reagents by the quart, and to accustom him to the use of small-sized apparatus and reagents by the drop, instead of thrusting him at once, and unprepared, into the rigors of microchemical analysis. Useful in school laboratories unable, because of the war, to obtain large quantities of chemicals.

Science News Letter, April 4, 1942

ECONOMICS

FAMILY EXPENDITURES IN THE UNITED STATES, Statistical Tables and Appendixes—U. S. National Resources Planning Board—*Govt. Print. Off.*, 209 p., 50c.

Science News Letter, April 4, 1942

MINERALOGY

FIRE IN THE EARTH, The Story of the Diamond—James Remington McCarthy—*Harper*, 263 p., \$2.50. Diamonds in romantic legend and vivid history, diamonds in cold fact and colder trade, gleam through the pages of this book. Of practical interest to the reader, perhaps, is the chapter on how to buy a diamond; also the final one on industrial diamonds.

Science News Letter, April 4, 1942